



SECTION 29

WORKING ON OR NEAR EXPOSED ENERGIZED PARTS



1. WORKING ON OR NEAR EXPOSED ENERGIZED PARTS

- A. OSHA References:** 29 CFR 1910.269
- B. General:** Only qualified employees may work in areas containing unguarded, un-insulated energized lines or parts of equipment operating at 50 volts or more. Electric lines and equipment shall be considered and treated as energized. At least two employees shall be present while the following types of work is being performed:
1. Installation, removal, or repair of lines that are energized at more than 600 volts.
 2. Installation, removal, or repair of deenergized lines if an employee is exposed to contact with other parts energized at more than 600 volts.
 3. Installation, removal, or repair of equipment, such as transformers, capacitors, and regulators, if an employee is exposed to contact with parts energized at more than 600 volts.
 4. Work involving the use of mechanical equipment, other than insulated aerial lifts, near parts energized at more than 600 volts.
- C. Minimum Approach Distances:** The employer shall ensure that no employee approaches or takes any conductive object closer to exposed energized parts than set forth in Table R-6 through Table R-10, unless:
1. The employee is insulated from the energized part.
 2. The energized part is insulated from the employee and from any other conductive object at a different potential.
 3. The employee is insulated from any other exposed conductive object, as during live-line bare hand work.
- D. Working Position:** The employer shall ensure that each employee, to the extent that other safety-related conditions at the worksite permit, works in a position from which a slip or shock will not bring the employee's body into contact with exposed, uninsulated parts energized at a potential different from the employee.



- E. Making Connections:** The employer shall ensure connections are made as follows:
1. In connecting deenergized equipment or lines to energize circuit by means of a conducting wire or device, an employee shall first attach the wire to the deenergized part.
 2. When disconnecting equipment or lines from the energized circuit by means of a conducting wire or device, an employee shall remove the source first.
 3. When lines or equipment are connected to or disconnected from energized circuits, loose conductors shall be kept away from exposed energized parts.
- F. Apparel:** When work is performed within reaching distance of exposed energized parts of equipment, the employer shall ensure that each employee removes or renders nonconductive all exposed conductive articles, such as key or watch chains, rings, or wrist watches or bands, unless such articles do not increase the hazards associated with contact with energized parts.
- G.** The employer shall ensure that each employee who is exposed to the hazards of flames or electric arcs does not wear clothing that, when exposed to flames or electric arcs, could increase the extent of injury that would be sustained by the employee.
- H. Fuse Handling:** When fuses must be installed or removed with one or both terminals energized at more than 300 volts or with exposed parts energized at more than 50 volts, the employer shall ensure that tools or gloves rated for the voltage are used. When expulsion-type fuses are installed with one or both terminals energized at more than 300 volts, the employer shall ensure that each employee wears eye protection.

2. DEENERGIZED LINES AND EQUIPMENT

- A.** A designated employee shall make a request of the system operator to have the particular section of line or equipment deenergized. The designated employee becomes the employee in charge and is responsible for the clearance.
- B.** All switches, disconnectors, jumpers, taps, or other means through which known sources of electric energy may be supplied to the particular lines and equipment to be deenergized shall be opened.
- C.** Such means shall be rendered inoperable, unless its design does not so permit, and tagged to indicate that employees are at work.



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1. Automatically and remotely controlled switches that could cause the opened disconnecting means to close shall also be tagged at the point of control.
2. The automatic and remote control feature shall be rendered inoperable, unless its design does not so permit.
3. Tags shall prohibit operation of the disconnecting means and shall indicate that employees are at work.

D. **Protective Grounds:** Shall be installed as required.

1. Only after all protective grounds have been removed, after all crews working on the lines or equipment have released their clearance, after all employees are clear of the lines and equipment, and after all protective tags have been removed from a given point of disconnection may action be initiated to reenergize the lines or equipment at the point disconnection.

E. Grounding For the Protection Of Employees

This section applies to the grounding of transmission and distribution lines and equipment for the purpose of protecting employees.

1. **General:** For the employees to work lines of equipment as deenergized, the lines or equipment shall be deenergized and shall be grounded. However, if the employer can demonstrate that installation of a ground impracticable or that conditions resulting from the installation of a ground would present greater hazards than working without grounds, the lines and equipment may be treated as deenergized provided all of the following conditions are met:
 - a) The lines and equipment have been deenergized
 - b) There is no possibility of contact with another energized source
 - c) The hazard of induced voltage is present
2. "Equipotential Zone" Temporary protective grounds shall be placed at such locations and arranged in such a manner as to prevent each employee from being exposed to hazardous differences in electric potential.
3. **Protective Grounding Equipment:** Protective grounding equipment shall be capable of conducting the maximum fault current that could flow at the point of grounding for the time necessary to clear the fault. The equipment shall have a capacity greater than or equal to that No. 2 AWG cooper.



- a) Protective grounds shall have an impedance low enough to cause immediate operation of protective devices in case of accidental energized of the lines or equipment.
- b) "Testing". Before any ground is installed, lines and equipment shall be tested and found absent of nominal voltage, unless a previously installed ground is present.
- c) "Order Of Connection". When a ground is to be removed, the grounding device shall be removed from the line or equipment using a live-line tool.
- d) "Additional Precautions". When work is performed on a cable at a location remove from the cable terminal, the cable may not be grounded at the cable terminal if there is a possibility of hazardous transfer of potential should a fault occur.

F. Safety Reference Points

- 1. Regardless of how many persons are present, workman or visitors, at a Substation or location of any High Voltage Equipment, **one (1) person must be in charge, and only one!** This person must be trained and familiar with the equipment, safety requirements, and procedures for energizing/deenergizing!
 - a) Always wear the proper PPE (Personal Protective Equipment).
 - b) Always test your testers, before and after, each use.
 - c) Always remove all grounds from current carrying conductors before energizing. If you put it on take it off.
 - d) OSHA High Voltage proximity starts at ten (10) feet.
 - e) If you don't know, ASK!

**SAFETY
MUST NEVER
BE
COMPROMISED!**